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**Household and similar devices with ultra-violet  
disinfection of drinking water treatment unit**

家用和类似用途饮用水处理装置用紫外线杀菌单元

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## Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard was proposed by China Light Industry Federation.

This Standard shall be under the jurisdiction of National Technical Committee on Household Appliances of Standardization Administration of China (SAC/TC 46).

The drafting organizations of this Standard: Ningbo Hydrotek Co., Ltd., Zhejiang Patio Water Treatment Technology Co., Ltd., Beijing Origin Water Pure Tech Co., Ltd., Qingdao Risheng Electric Service Co., Ltd., Zhongshan Shide Light Industry Mechanical & Electrical Products Co., Ltd., China Quality Inspection Association of Water Purification Equipment Professional Committee, China Household Electrical Appliances Research Institute, Changzhou Peide Water Treatment Equipment Co., Ltd., Lota (Xiamen) Industrial Co., Ltd., Qingdao Jiasheng Electric Co., Ltd.

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This Standard was issued for the first time.

# Household and similar devices with ultra-violet disinfection of drinking water treatment unit

## 1 Scope

This Standard specifies the terms and definitions, classification and naming, requirements, test methods, inspection rules and marking, packaging, transport, storage for household and similar devices with ultra-violet disinfection of drinking water treatment unit.

This Standard applies to household and similar devices with ultra-violet disinfection of drinking water treatment unit and ultraviolet disinfection equipment of independent use.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 191, *Packaging and storage marks*

GB/T 1019, *General requirements for the package of household and similar electrical appliances*

GB/T 2423.17, *Environmental testing for electric and electronic products - Part 2: Test method - Test Ka: Salt mist*

GB/T 2828.1, *Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

GB 4706.1, *Safety of household and similar electrical appliances; General requirements*

GB 5296.2, *Instructions for use of products of consumer interest - Part 2: Household and similar electrical appliances*

GB 5749, *Sanitary standard for drinking water*

GB/T 5750, *Standard examination methods for drinking water*

GB/T 17219, *Standard for Safety Evaluation of Equipment and Protective Mater*

GB/T 19857, *Determination of malachite green and crystal violet residues in aquatic product*

Ministry of Health, *"Drinking Water Disinfectant and Disinfection Equipment, Health and Safety Evaluation" (Trial) (2001)*

Ministry of Health, *"Ministry of Health on Drinking Water Safety and Safety Products Inspection Requirements" (2001)*

### **3 Terms and definitions**

For the purposes of this document, the following terms and definitions apply.

#### **3.1 drinking water treatment device**

a system capable of improving water quality that consists of one or several drinking water treatment units

#### **3.2 ultra-violet disinfection**

the process of using ultraviolet radiation of which the wavelength is 200nm ~ 300 nm to kill the microorganisms or make the microorganisms lose activity

#### **3.3 household and similar devices with ultra-violet disinfection of drinking water treatment**

using ultraviolet disinfection principle, as a component of household and similar use of drinking water treatment device, hereinafter referred to as "ultra-violet disinfection unit"

#### **3.4 effective dose of ultra-violet**

the microbial inactivation of ultra-violet dosage realized by ultra-violet disinfection unit

NOTE: The unit is  $\text{mJ}/\text{cm}^2$ .

#### **3.5 water flow**

under the specified operating conditions, the nominal amount of water per unit of time of ultra-violet disinfection unit manufacturer

- a) municipal tap water or other centralized water supply, as well as water for other processing units in household and similar drinking water treatment plants;
- b) pressure: 0.1 MPa ~ 0.4 MPa;
- c) water pressure: 5°C ~ 38°C;
- d) turbidity: not greater than 1 NTU.

**5.1.2** The environmental conditions are as follows:

- a) temperature: 4°C ~ 40°C;
- b) relative humidity: not greater than 90% (at 25°C).

**5.2 Appearance**

**5.2.1** The ultra-violet disinfection unit shall look neat, without rust.

**5.2.2** The exposed structure surface of ultra-violet disinfection unit shall be flat, smooth, without sharp edges.

**5.2.3** The shell coating surface of ultra-violet disinfection unit shall be flat, smooth. The color shall be uniform. The coating shall be firm. There shall be no obvious scars, scratches, wrinkles, linen, blistering, leakage coating or collection of sand or other defects. The decorative coating of electroplating parts shall be smooth and fine, with uniform color. There shall be no defects such as spots, rust spots, pinholes, bubbles or coating peeling. The surface of plastic parts shall be flat, smooth, with uniform color, without cracks, bubbles, significant shrinkage, deformation, etc.

**5.3 Materials**

**5.3.1** The material in contact with water shall meet requirements of GB/T 17219.

**5.3.2** The metal material in contact with water shall be resistant to corrosion.

**5.3.3** After plastic, rubber materials are subject to ultraviolet radiation, within the nominal life of the material by the manufacturer, the material shall not be deformed, softened, broken; the structure strength of the material shall meet requirements of 5.4.2. The health and safety of the materials shall comply with the requirements of 5.3.1.

**5.3.4** The material used for the ultra-violet disinfection unit shall be capable of withstanding the temperature at which the ultra-violet lamp is lit during an anhydrous period.

1 - low water level alarm device; 2 - pump; 3 - counter; 4 - electromagnetic valve; 5 - ring timer; 6 - pressure gauge; 7 - pressure relief valve; 8 - low water level alarm device; 9 - water storage container; 10 - pressure tank; 11 - testing ultra-violet disinfection unit; 12 - drainage device.

### Figure 1 -- Static pressure, cycle pressure test devices diagram

#### 6.4.2.2 Static pressure test

Carry out the static pressure test of ultra-violet disinfection unit according to the following requirements:

- a) the temperature of the test water shall be maintained at  $(20 \pm 3)^{\circ}\text{C}$ ;
- b) connect the inlet and outlet ports of the ultra-violet disinfection unit to the test devices shown in Figure 1;
- c) fill the ultra-violet disinfection unit with water so that all the air within the ultra-violet disinfection unit are emptied; close the outlet and drain of the ultra-violet disinfection unit; start the pump to apply pressure to the ultra-violet disinfection unit;
- d) increase the pressure at not less than  $0.4 \text{ MPa/s}$  to the pressure valued specified in Table 1 within 5 s;
- e) maintain the test pressure for 15 min; during the entire process of the test, continuously check the water tightness of the ultra-violet disinfection unit.

#### 6.4.2.3 Cycle pressure test

Carry out the cycle pressure test of ultra-violet disinfection unit according to the following requirements:

- a) the temperature of the whole cycle test shall be maintained at  $(20 \pm 3)^{\circ}\text{C}$  and shall be adjusted so that no condensation is formed on the surface of the test device;
- b) connect the inlet and outlet ports of the ultra-violet disinfection unit to the test devices shown in Figure 1;
- c) fill the ultra-violet disinfection unit with water so that all the air within the ultra-violet disinfection unit are emptied; close the outlet and drain of the ultra-violet disinfection unit; start the pump to apply pressure to the ultra-violet disinfection unit;
- d) after the counter is zeroed or the initial reading is recorded, start the pressure cycle test; increase the pressure of each cycle 1 s ~ 3 s, the